Attachment A: Flow Frequency Memorandum

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office
4949-A Cox Road Glen Allen, Virginia 23060

SUBJECT: Flow Frequency Determination / 303(d) Status
Iluka Resources Hickory Concentrator – VA00092126

TO: Janine Howard

FROM: Jennifer Palmore, P.G.

DATE: February 24, 2012

COPIES: File

The Iluka Resources Hickory Mine Concentrator facility discharges to an unnamed tributary of Harris Swamp near Bolsters Store, VA. The outfall (002) is located at rivermile 5AXHI000.31. Flow frequencies have been requested at this site for use in developing effluent limitations for the VPDES permit.

At the discharge point, the receiving stream is shown as a dry ditch which becomes an intermittent stream. The flow frequencies for dry ditches and intermittent streams are listed below:

UT to Harris Swamp:

1Q30 = 0.00 cfs	High Flow 1Q10 = 0.00 cfs
1Q10 = 0.00 cfs	High Flow 7Q10 = 0.00cfs
7Q10 = 0.00 cfs	High Flow 30Q10 = 0.00 cfs
30Q10 = 0.00 cfs	HM = 0.00 cfs
30Q5 = 0.00 cfs	

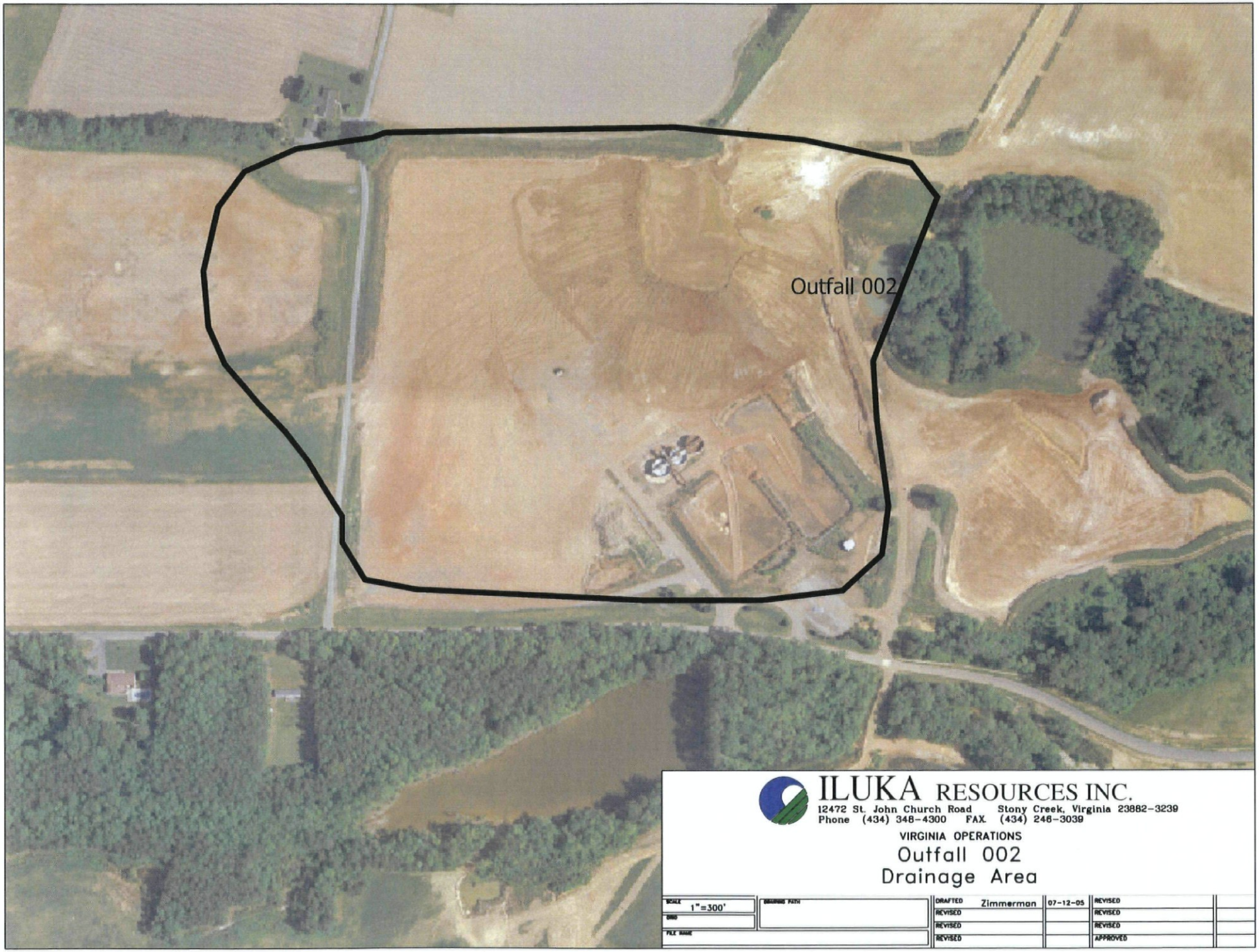
During the 2010 305(b)/303(d) Water Quality Assessment, the receiving stream was not assessed for any of its designated uses, therefore it was considered a Category 3A water. The Water Quality Standards designate the tributary as Class VII waters.

Due to its ephemeral nature, the tributary should be considered a Tier 1 water. Effluent data should be used to characterize the stream during low-flow conditions.

The discharge is not addressed in a current TMDL.

If you have any questions concerning this analysis, please let me know.

Attachment B: Site Diagram

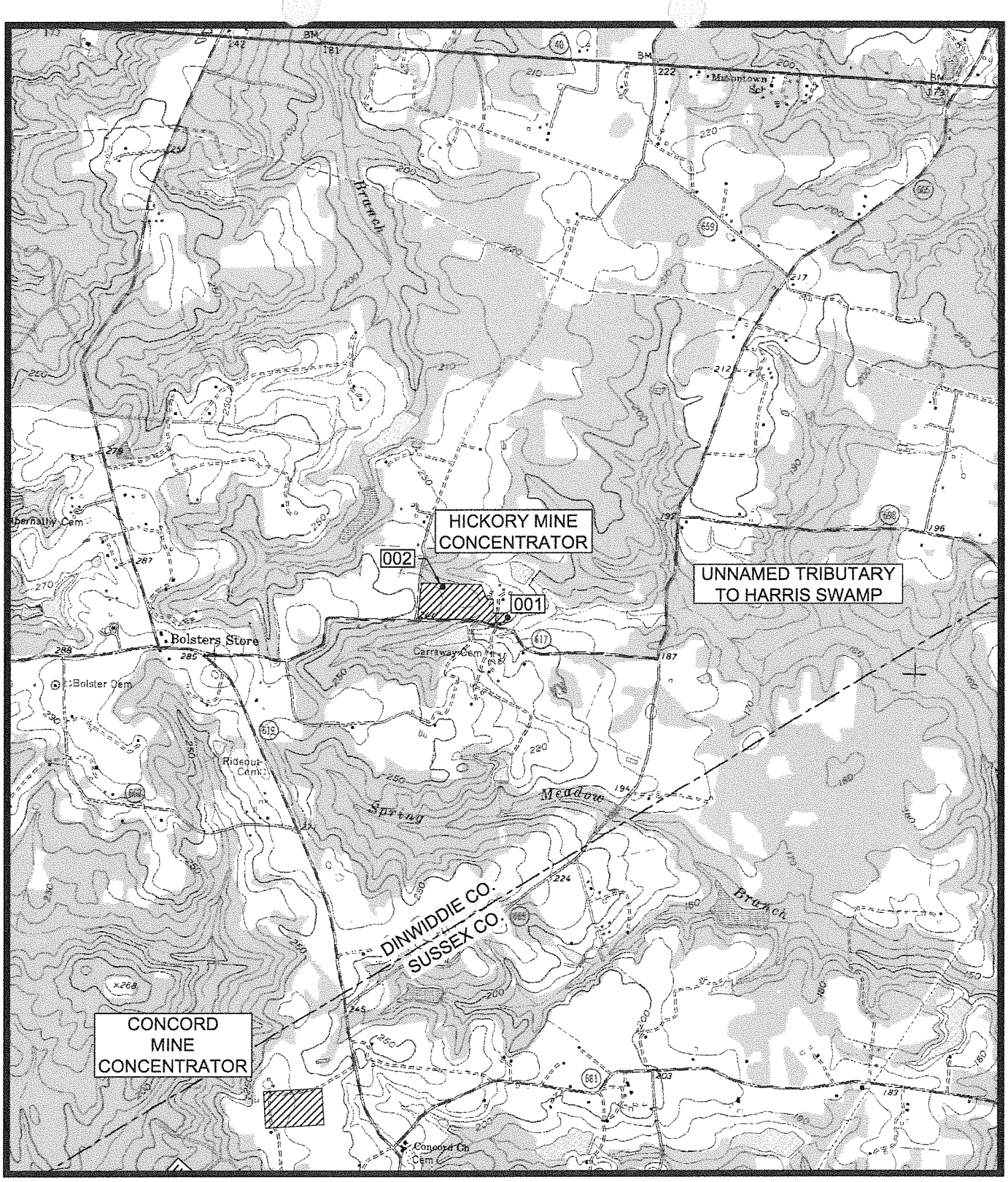


ILUKA RESOURCES INC.
12472 St. John Church Road Stony Creek, Virginia 23882-3239
Phone (434) 348-4300 FAX (434) 246-3039
VIRGINIA OPERATIONS

Outfall 002 Drainage Area

SCALE 1"=300'	DRAWING PATH	DRAFTED Zimmerman	07-12-05	REVISED	
DWG		REVISED		REVISED	
FILE NAME		REVISED		REVISED	
		REVISED		APPROVED	

Attachment C: Topographic Map
(USGS Cherry Hill Quadrangle 40D)



ILUKA RESOURCES INC.

VPDES PERMIT APPLICATION
DINWIDDIE COUNTY, VIRGINIA

Prepared by:

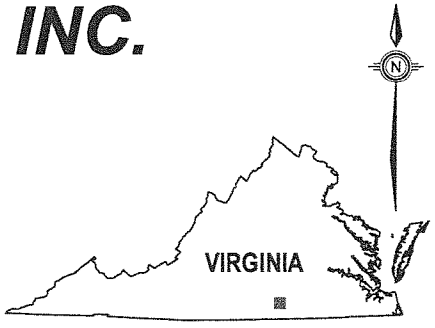
MARSHALL MILLER & ASSOCIATES

F94137 1/10/07

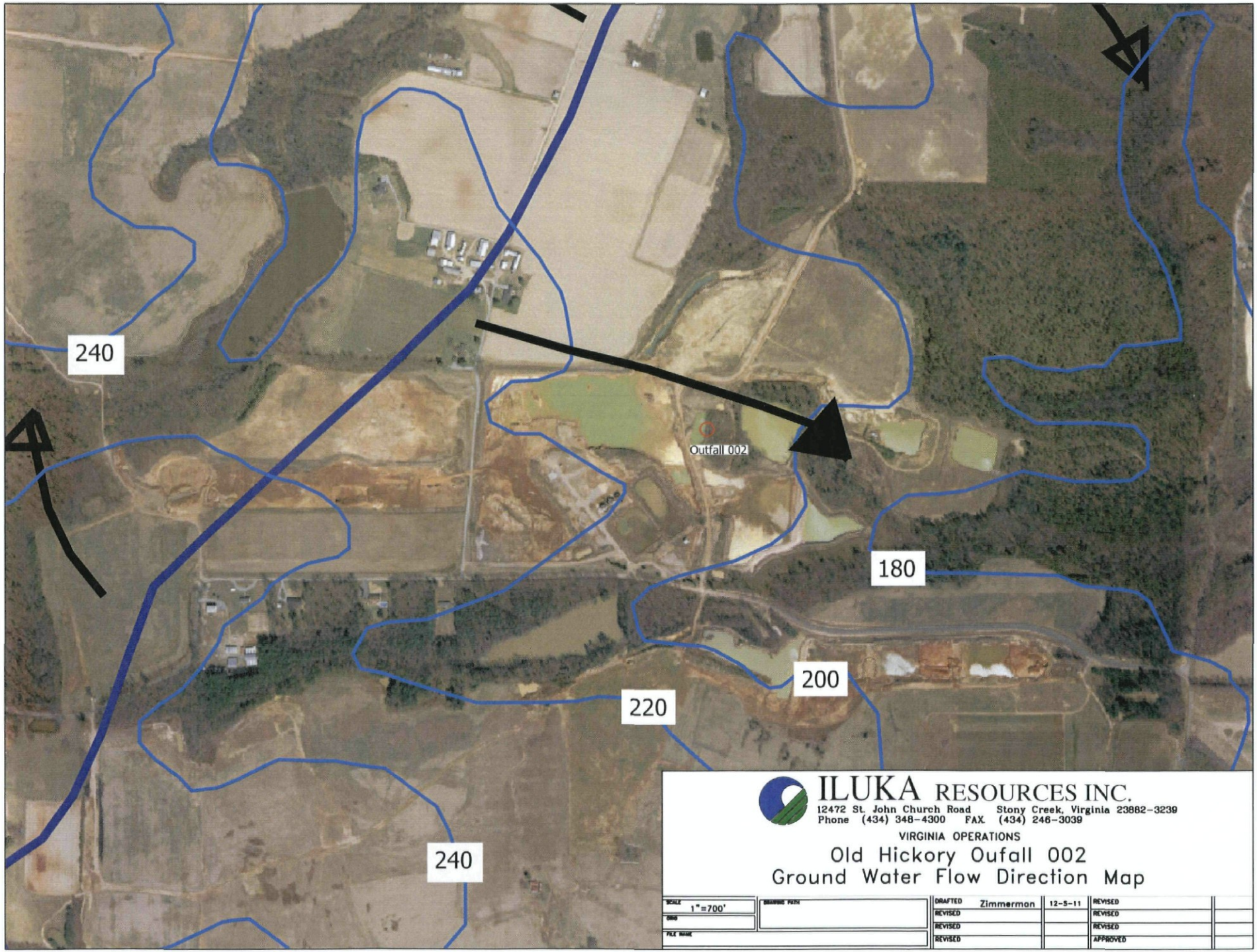
2,500' 0 2,500'

SCALE 1:30,000

USGS 7.5' CHERRY HILL, VA QUADRANGLE - 1963
PHOTOREVISED 1986 - CONTOUR INTERVAL=10'



VICINITY MAP



ILUKA RESOURCES INC.

12472 St. John Church Road Stony Creek, Virginia 23882-3239
Phone (434) 348-4300 FAX (434) 246-3039

VIRGINIA OPERATIONS

Old Hickory Oufall 002
Ground Water Flow Direction Map

SCALE 1"=700'	DRAWING PATH	DRAFTED Zimmerman	12-5-11	REVISED	
GRID		REVISED		REVISED	
FILE NAME		REVISED		REVISED	
		REVISED		APPROVED	

Attachment D: Site Inspection Report

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office

4949-A Cox Rd Glen Allen, VA 23060 (804) 527-5020

SUBJECT: Site Visit- VA0092126- Iluka Resources Old Hickory Mine (VA0092126) - Site Visit

TO: File

FROM: Janine Howard, Water Permit Writer

DATE: 14 March 2012

On March 13, 2012 at 9:30am I met Kevin Rideout, Environmental Specialist and David Mathews, Environmental Supervisor of Iluka Resources, Inc. at the Mineral Separation Plant offices located in Stony Creek, VA. I am in the process of reissuing the Old Hickory permit (VA0092126) and the purpose of the site visit was to view the reclamation of the site and Outfall 002.

Much of the land area that was previously mined has already been reclaimed. Vegetation has returned and the terrain appears undisturbed over much of the land area. The area in closest proximity to Outfall 002 is still devoid of vegetation. Iluka is working on a plan to grade and restore this area in such a way that the sediment pond which feeds Outfall 002 will be entirely filled and reclaimed. Iluka aims to achieve sheet flow conditions in the immediate area of the outfall, eliminating a point source discharge of storm water from the site. Iluka is considering using level spreaders and vegetative buffers to diffuse storm water runoff across the area. It is unlikely that this will be completed prior to the permit reissuance; therefore, Outfall 002 will remain in the proposed 2012 permit. Storm water runoff volumes are expected to diminish as the site is reclaimed and vegetation returns, naturally slowing the runoff rate and enhancing infiltration.

When I visited the site in summer of 2010, although production had ceased at the site, the process ponds and the concentrator structure were still in place. During this site visit it was confirmed that the process ponds have been reclaimed and all structures have been removed from the site. No materials are stored on site.

Attachment E: Discharge Monitoring Report (DMR) data

VA0092126 DMR Data

Table 1. Outfall 001 data

Due date	Average Flow (MGD)	Max Flow (MGD)	Minimum pH (SU)	Maximum (pH)	Average TSS (mg/L)	Max TSS (mg/L)
10-Jan-08	NULL	NULL	NULL	NULL	NULL	NULL
10-Apr-08	1.13	2.11	6.12	8.97	31.2	31.2
10-Jul-08	1.08	1.94	6.03	8.67	29.5	37.3
10-Oct-08	0.55	1.01	6.64	8.58	10.5	21.0
10-Jan-09	1.865	2.592	6.03	8.10	19.0	23.0
10-Apr-09	1.787	2.592	6.02	8.90	15.9	19.8
10-Jul-09	NULL	NULL	NULL	NULL	NULL	NULL
10-Oct-09	NULL	NULL	NULL	NULL	NULL	NULL
10-Jan-10	NULL	NULL	NULL	NULL	NULL	NULL
10-Apr-10	0.001	0.063	6.63	6.63	82.5	82.5
10-Jul-10	NULL	NULL	NULL	NULL	NULL	NULL
10-Oct-10	NULL	NULL	NULL	NULL	NULL	NULL
10-Jan-11	NULL	NULL	NULL	NULL	NULL	NULL
10-Apr-11	NULL	NULL	NULL	NULL	NULL	NULL
10-Jul-11	NULL	NULL	NULL	NULL	NULL	NULL
10-Oct-11	0.005	0.216	6.19	6.19	76	76
10-Jan-12	NULL	NULL	NULL	NULL	NULL	NULL
				90^{th} %: 8.9		
				10^{th} %: 6.4		

Note: The facility was shutdown prior to the copper limitation taking effect, therefore no copper DMR data is available.

Table 2. Outfall 002 data

Due date	Average Flow (MGD)	Max Flow (MGD)	Minimum pH (SU)	Maximum (pH)	Average TSS (mg/L)	Max TSS (mg/L)
10-Jan-08	NULL	NULL	NULL	NULL	NULL	NULL
10-Apr-08	NULL	NULL	NULL	NULL	NULL	NULL
10-Jul-08	0.009	0.009	6.56	6.56	118.7	118.7
10-Oct-08	NULL	NULL	NULL	NULL	NULL	NULL
10-Jan-09	NULL	NULL	NULL	NULL	NULL	NULL
10-Apr-09	NULL	NULL	NULL	NULL	NULL	NULL
10-Jul-09	NULL	NULL	NULL	NULL	NULL	NULL
10-Oct-09	NULL	NULL	NULL	NULL	NULL	NULL
10-Jan-10	NULL	NULL	NULL	NULL	NULL	NULL
10-Apr-10	0.075	0.161	6.94	8.83	14.6	14.6
10-Jul-10	0.063	0.171	6.32	8.92	16.2	16.2
10-Oct-10	NULL	NULL	NULL	NULL	NULL	NULL
10-Jan-11	0.011	0.210	6.47	6.71	12.0	12.0
10-Apr-11	0.004	0.180	6.23	6.23	13.4	13.4
10-Jul-11	NULL	NULL	NULL	NULL	NULL	NULL
10-Oct-11	0.105	0.468	6.02	8.89	24	24
10-Jan-12	0.114	0.576	6.02	7.72	25.9	35.2
				90^{th} %: 8.9		
				10^{th} %: 6.4		

Note: The facility was shutdown prior to the copper limitation taking effect, therefore no copper DMR data is available.

Attachment F: Application data
(Form 2F and
Attachment A Water Quality Criteria Monitoring)

VII. Discharge information *(Continued from page 3 of Form 2F)*

Part A – You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

Pollutant and CAS Number *(if available)*	Maximum Values *(include units)*		Average Values *(include units)*		Number of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite		
Oil and Grease	<5.0 mg/L	N/A			1	
Biological Oxygen Demand (BOD5)	<3.0 mg/L	<3.0 mg/L			1	
Chemical Oxygen Demand (COD)	66.7 mg/L	44.5 mg/L			1	
Total Suspended Solids (TSS)	32.0 mg/L	31.4 mg/L			1	
Total Nitrogen	3.76 mg/L	2.8 mg/L			1	
Total Phosphorus	0.51 mg/L	0.62 mg/L			1	
pH	Minimum 6.61	Maximum 6.68	Minimum	Maximum	1	

Part B – List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements.

Pollutant and CAS Number *(if available)*	Maximum Values *(include units)*		Average Values *(include units)*		Number of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite		
Total Copper	<0.020 mg/L	<0.020			1	None Present

 Continue on Reverse

Continued from the Front

Part C - List each pollutant shown in Table 2F-2, 2F-3, and 2F-4 that you know or have reason to believe is present. See the instructions for additional details and requirements. Complete one table for each outfall.

Pollutant and CAS Number *(if available)*	Maximum Values *(include units)*		Average Values *(include units)*		Number of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite	Grab Sample Taken During First 20 Minutes	Flow-Weighted Composite		

Part D – Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

1. Date of Storm Event	2. Duration of Storm Event *(in minutes)*	3. Total rainfall during storm event *(in inches)*	4. Number of hours between beginning of storm measured and end of previous measurable rain event	5. Maximum flow rate during rain event *(gallons/minute or specify units)*	6. Total flow from rain event *(gallons or specify units)*
10/3/2011	480 minutes	0.26"	96 hours	5 gpm	30,600

7. Provide a description of the method of flow measurement or estimate.

The depth, width, and velocity of the discharing water was measured flowing through the outfall and the discharge rate was calculated. The date of the sampling and the storm event are two days apart due to the time it took for the storm water to flow into the pond and cause the discharge.

ATTACHMENT A
DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY CRITERIA MONITORING

CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL[1]	REPORTING RESULTS	SAMPLE TYPE[2]	SAMPLE FREQUENCY
METALS						
7440-36-0	Antimony, dissolved	(3)	1.4	<0.0014 mg/L	G or C	1/5 YR
7440-38-2	Arsenic, dissolved	(3)	1.0	<0.001 mg/L	G or C	1/5 YR
7440-43-9	Cadmium, dissolved	(3)	0.3	<0.003 mg/L	G or C	1/5 YR
16065-83-1	Chromium III, dissolved [8]	(3)	3.6	<0.0036 mg/L	G or C	1/5 YR
18540-29-9	Chromium VI, dissolved [8]	(3)	1.6	<0.005 mg/L	G or C	1/5 YR
7440-50-8	Copper, dissolved	(3)	0.50	<0.0005 mg/L	G or C	1/5 YR
7439-92-1	Lead, dissolved	(3)	0.50	<0.0005 mg/L	G or C	1/5 YR
7439-97-6	Mercury, dissolved	(3)	1.0	<0.001 mg/L	G or C	1/5 YR
7440-02-0	Nickel, dissolved	(3)	0.94	<0.00094 mg/L	G or C	1/5 YR
7782-49-2	Selenium, Total Recoverable	(3)	2.0	<0.002 mg/L	G or C	1/5 YR
7440-22-4	Silver, dissolved	(3)	0.20	<0.0002 mg/L	G or C	1/5 YR
7440-28-0	Thallium, dissolved	(4)	(5)	<0.002 mg/L	G or C	1/5 YR
7440-66-6	Zinc, dissolved	(3)	3.6	<0.0036 mg/L	G or C	1/5 YR
PESTICIDES/PCB'S						
309-00-2	Aldrin	608	0.05	<0.05 ug/L	G or C	1/5 YR
57-74-9	Chlordane	608	0.2	<0.20 ug/L	G or C	1/5 YR
2921-88-2	Chlorpyrifos (synonym = Dursban)	(4)	(5)	<0.2 ug/L	G or C	1/5 YR
72-54-8	DDD	608	0.1	<0.10 ug/L	G or C	1/5 YR
72-55-9	DDE	608	0.1	<0.10 ug/L	G or C	1/5 YR
50-29-3	DDT	608	0.1	<0.10 ug/L	G or C	1/5 YR
8065-48-3	Demeton	(4)	(5)	<1 ug/L	G or C	1/5 YR
333-41-5	Diazinon	(4)	(5)	<1 ug/L	G or C	1/5 YR
60-57-1	Dieldrin	608	0.1	<0.10 ug/L	G or C	1/5 YR
959-98-8	Alpha-Endosulfan	608	0.1	<0.10 ug/L	G or C	1/5 YR
33213-65-9	Beta-Endosulfan	608	0.1	<0.10 ug/L	G or C	1/5 YR
1031-07-8	Endosulfan Sulfate	608	0.1	<0.10 ug/L	G or C	1/5 YR

CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL[1]	REPORTING RESULTS	SAMPLE TYPE[2]	SAMPLE FREQUENCY
72-20-8	Endrin	608	0.1	<0.10 ug/L	G or C	1/5 YR
7421-93-4	Endrin Aldehyde	(4)	(5)	<0.10 ug/L	G or C	1/5 YR
86-50-0	Guthion	(4)	(5)	<1 ug/L	G or C	1/5 YR
76-44-8	Heptachlor	608	0.05	<0.10 ug/L	G or C	1/5 YR
1024-57-3	Heptachlor Epoxide	(4)	(5)	<0.10 ug/L	G or C	1/5 YR
319-84-6	Hexachlorocyclohexane Alpha-BHC	608	(5)	<0.05 ug/L	G or C	1/5 YR
319-85-7	Hexachlorocyclohexane Beta-BHC	608	(5)	<0.05 ug/L	G or C	1/5 YR
58-89-9	Hexachlorocyclohexane Gamma-BHC or Lindane	608	(5)	<0.05 ug/L	G or C	1/5 YR
143-50-0	Kepone	(9)	(5)	<0.10 ug/L	G or C	1/5 YR
121-75-5	Malathion	(4)	(5)	<1 ug/L	G or C	1/5 YR
72-43-5	Methoxychlor	(4)	(5)	<0.10 ug/L	G or C	1/5 YR
2385-85-5	Mirex	(4)	(5)	<0.10 ug/L	G or C	1/5 YR
56-38-2	Parathion	(4)	(5)	<1 ug/L	G or C	1/5 YR
1336-36-3	PCB Total	608	7.0	<1.0 ug/L	G or C	1/5 YR
8001-35-2	Toxaphene	608	5.0	<5.0 ug/L	G or C	1/5 YR
BASE NEUTRAL EXTRACTABLES						
83-32-9	Acenaphthene	625	10.0	<10 ug/L	G or C	1/5 YR
120-12-7	Anthracene	625	10.0	<10 ug/L	G or C	1/5 YR
92-87-5	Benzidine	(4)	(5)	<10 ug/L	G or C	1/5 YR
56-55-3	Benzo (a) anthracene	625	10.0	<10 ug/L	G or C	1/5 YR
205-99-2	Benzo (b) fluoranthene	625	10.0	<10 ug/L	G or C	1/5 YR
207-08-9	Benzo (k) fluoranthene	625	10.0	<10 ug/L	G or C	1/5 YR
50-32-8	Benzo (a) pyrene	625	10.0	<10 ug/L	G or C	1/5 YR
111-44-4	Bis 2-Chloroethyl Ether	(4)	(5)	<10 ug/L	G or C	1/5 YR
108-60-1	Bis 2-Chloroisopropyl Ether	(4)	(5)	<10 ug/L	G or C	1/5 YR
85-68-7	Butyl benzyl phthalate	625	10.0	<10 ug/L	G or C	1/5 YR
91-58-7	2-Chloronaphthalene	(4)	(5)	<10 ug/L	G or C	1/5 YR
218-01-9	Chrysene	625	10.0	<10 ug/L	G or C	1/5 YR
53-70-3	Dibenz(a,h)anthracene	625	20.0	<10 ug/L	G or C	1/5 YR

CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL[1]	REPORTING RESULTS	SAMPLE TYPE[2]	SAMPLE FREQUENCY
84-74-2	Dibutyl phthalate (synonym = Di-n-Butyl Phthalate)	625	10.0	<10 ug/L	G or C	1/5 YR
95-50-1	1,2-Dichlorobenzene	624	10.0	<10 ug/L	G or C	1/5 YR
541-73-1	1,3-Dichlorobenzene	624	10.0	<10 ug/L	G or C	1/5 YR
106-46-7	1,4-Dichlorobenzene	624	10.0	<10 ug/L	G or C	1/5 YR
91-94-1	3,3-Dichlorobenzidine	(4)	(5)	<10 ug/L	G or C	1/5 YR
84-66-2	Diethyl phthalate	625	10.0	<10 ug/L	G or C	1/5 YR
117-81-7	Bis-2-ethylhexyl phthalate	625	10.0	<10 ug/L	G or C	1/5 YR
131-11-3	Dimethyl phthalate	(4)	(5)	<10 ug/L	G or C	1/5 YR
121-14-2	2,4-Dinitrotoluene	625	10.0	<10 ug/L	G or C	1/5 YR
122-66-7	1,2-Diphenylhydrazine	(4)	(5)	<10 ug/L	G or C	1/5 YR
206-44-0	Fluoranthene	625	10.0	<10 ug/L	G or C	1/5 YR
86-73-7	Fluorene	625	10.0	<10 ug/L	G or C	1/5 YR
118-74-1	Hexachlorobenzene	(4)	(5)	<10 ug/L	G or C	1/5 YR
87-68-3	Hexachlorobutadiene	(4)	(5)	<10 ug/L	G or C	1/5 YR
77-47-4	Hexachlorocyclopentadiene	(4)	(5)	<10 ug/L	G or C	1/5 YR
67-72-1	Hexachloroethane	(4)	(5)	<10 ug/L	G or C	1/5 YR
193-39-5	Indeno(1,2,3-cd)pyrene	625	20.0	<10 ug/L	G or C	1/5 YR
78-59-1	Isophorone	625	10.0	<10 ug/L	G or C	1/5 YR
98-95-3	Nitrobenzene	625	10.0	<10 ug/L	G or C	1/5 YR
62-75-9	N-Nitrosodimethylamine	(4)	(5)	<10 ug/L	G or C	1/5 YR
621-64-7	N-Nitrosodi-n-propylamine	(4)	(5)	<10 ug/L	G or C	1/5 YR
86-30-6	N-Nitrosodiphenylamine	(4)	(5)	<10 ug/L	G or C	1/5 YR
129-00-0	Pyrene	625	10.0	<10 ug/L	G or C	1/5 YR
120-82-1	1,2,4-Trichlorobenzene	625	10.0	<10 ug/L	G or C	1/5 YR
VOLATILES						
107-02-8	Acrolein	(4)	(5)	<5.0 ug/L	G	1/5 YR
107-13-1	Acrylonitrile	(4)	(5)	<5.0 ug/L	G	1/5 YR
71-43-2	Benzene	624	10.0	<5.0 ug/L	G	1/5 YR
75-25-2	Bromoform	624	10.0	<5.0 ug/L	G	1/5 YR

CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL[1]	REPORTING RESULTS	SAMPLE TYPE[2]	SAMPLE FREQUENCY
56-23-5	Carbon Tetrachloride	624	10.0	<5.0 ug/L	G	1/5 YR
108-90-7	Chlorobenzene (synonym = monochlorobenzene)	624	50.0	<5.0 ug/L	G	1/5 YR
124-48-1	Chlorodibromomethane	624	10.0	<5.0 ug/L	G	1/5 YR
67-66-3	Chloroform	624	10.0	<5.0 ug/L	G	1/5 YR
75-09-2	Dichloromethane (synonym = methylene chloride)	624	20.0	<5.0 ug/L	G	1/5 YR
75-27-4	Dichlorobromomethane	624	10.0	<5.0 ug/L	G	1/5 YR
107-06-2	1,2-Dichloroethane	624	10.0	<5.0 ug/L	G	1/5 YR
75-35-4	1,1-Dichloroethylene	624	10.0	<5.0 ug/L	G	1/5 YR
156-60-5	1,2-trans-dichloroethylene	(4)	(5)	<5.0 ug/L	G	1/5 YR
78-87-5	1,2-Dichloropropane	(4)	(5)	<5.0 ug/L	G	1/5 YR
542-75-6	1,3-Dichloropropene	(4)	(5)	<5.0 ug/L	G	1/5 YR
100-41-4	Ethylbenzene	624	10.0	<5.0 ug/L	G	1/5 YR
74-83-9	Methyl Bromide	(4)	(5)	<5.0 ug/L	G	1/5 YR
79-34-5	1,1,2,2-Tetrachloroethane	(4)	(5)	<5.0 ug/L	G	1/5 YR
127-18-4	Tetrachloroethylene	624	10.0	<5.0 ug/L	G	1/5 YR
10-88-3	Toluene	624	10.0	<5.0 ug/L	G	1/5 YR
79-00-5	1,1,2-Trichloroethane	(4)	(5)	<5.0 ug/L	G	1/5 YR
79-01-6	Trichloroethylene	624	10.0	<5.0 ug/L	G	1/5 YR
75-01-4	Vinyl Chloride	624	10.0	<5.0 ug/L	G	1/5 YR
	RADIONUCLIDES					
	Beta Particle & Photon Activity (mrem/yr)	(4)	(5)	2.4 ± 1.7 pCi/L	G or C	1/5 YR (PWS)
	Gross Alpha Particle Activity (pCi/L)	(4)	(5)	1.0 ± 1.4 pCi/L	G or C	1/5 YR (PWS)
	Combined Radium 226 and 228	(4)	(5)	0.62 ± 0.49 pCi/L	G or C	1/5 YR (PWS)
	Uranium	(4)	(5)	0.09 ± 0.01 pCi/L	G or C	1/5 YR (PWS)
	ACID EXTRACTABLES [6]					
95-57-8	2-Chlorophenol	625	10.0	<10 ug/L	G or C	1/5 YR
120-83-2	2,4 Dichlorophenol	625	10.0	<10 ug/L	G or C	1/5 YR
105-67-9	2,4 Dimethylphenol	625	10.0	<10 ug/L	G or C	1/5 YR
51-28-5	2,4-Dinitrophenol	(4)	(5)	<10 ug/L	G or C	1/5 YR

CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL[1]	REPORTING RESULTS	SAMPLE TYPE[2]	SAMPLE FREQUENCY
534-52-1	2-Methyl-4,6-Dinitrophenol	(4)	(5)	<10 ug/L	G or C	1/5 YR
25154-52-3	Nonylphenol	(5)	(5)	<10 ug/L	G or C	1/5 YR
87-86-5	Pentachlorophenol	625	50.0	<10 ug/L	G or C	1/5 YR
108-95-2	Phenol	625	10.0	<10 ug/L	G or C	1/5 YR
88-06-2	2,4,6-Trichlorophenol	625	10.0	<10 ug/L	G or C	1/5 YR
MISCELLANEOUS						
776-41-7	Ammonia as NH3-N	350.1	200	0.08 mg/L	C	1/5 YR
16887-00-6	Chlorides	(4)	(5)	10.7 mg/L	C	1/5 YR
7782-50-5	Chlorine, Total Residual	(4)	100	0.03 mg/L	G	1/5 YR
57-12-5	Cyanide, Free	(4)	10.0	<0.010 mg/L	G	1/5 YR
N/A	*E. coli* (N/CML)	(4)	(5)	<1.0 MPN/100 ml	G	1/5 YR
7783-06-4	Dissolved Sulfide	(5)	(5)	<0.05 mg/L	G	1/5 YR
60-10-5	Tributyltin [7]	NBSR 85-3295	(5)	<30 ng/L	G or C	1/5 YR
471-34-1	Hardness (mg/L as $CaCO_3$)	(4)	(5)	25.0 mg/L	G or C (10)	1/5 YR

MATTHEW B BLOCKWELL / PRESIDENT.

Name of Principal Exec. Officer or Authorized Agent/Title

12-05-11

Signature of Principal Officer or Authorized Agent/Date

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations. See 18 U.S.C. Sec. 1001 and 33 U.S.C. Sec. 1319. (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years.)

FOOTNOTES:

(1) Quantification level (QL) is defined as the lowest concentration used for the calibration of a measurement system when the calibration is in accordance with the procedures published for the required method.

The quantification levels indicated for the metals are actually Specific Target Values developed for this permit. The Specific Target Value is the approximate value that may initiate a wasteload allocation analysis. Target values are not wasteload allocations or effluent limitations. The Specific Target Values are subject to change based on additional information such as hardness data, receiving stream flow, and design flows.

Attachment G: Groundwater Discussion and Historical Documentation, including the Groundwater Monitoring Plan (approved 4/6/2007)

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office

4949-A Cox Road, Glen Allen, VA 23060-6296 **804/527-5020**

SUBJECT: Iluka Resources, Inc- Hickory Mine Concentrator Groundwater Discussion

TO: File

FROM: Janine Howard

DATE: February 29, 2012; updated April 4, 2012

Process and Background:

Iluka Resources Inc. operates a mineral sands mining and mineral separation business in Sussex and Greensville Counties in southeastern Virginia. The former Hickory Mine Concentrator (Sussex Co.) was Iluka's original mining location in Virginia. The site had been operational under a Virginia Pollution Abatement (VPA) permit (VPA00563) for over a decade and in 2007 a VPDES permit was deemed more appropriate to allow the facility to discharge their process wastewaters to state waters. The facility is located on the borderline between the Coastal Plain Physiographic Province and Piedmont and Blue Ridge Physiographic Province for which there are specific standards (9VAC25-280-50) and criteria (9VAC25-280-70). Virginia also has groundwater standards that are applicable statewide (9VAC25-280-40).

When the site was an active mine, Iluka utilized process water to move and separate mineral sands from clay and gangue minerals in the ore body. Coarse waste material was removed from the process water using screens and a gravity separation drum. The process water then entered a thickener, where suspended clays settled out. The settled clays were pumped to tailings ponds for disposal and post-mining land reclamation. The water then flowed from the thickener to the operational units associated with the permit. These units consisted of a clarifying pond and process water pond operated in series and used to settle fine solids from the process water prior to reuse or discharge via Outfall 001.

A groundwater monitoring plan had previously been developed under the VPA permit and was approved in September 2000. A revised groundwater monitoring plan was required to be developed as part of the issuance of the VPDES permit. The purpose of the plan was to assess the integrity of the treatment units (clarifying pond and process water pond) and identify potential groundwater degradation due to the industrial activities taking place on site. The VPDES groundwater monitoring plan utilized the three existing monitoring wells and was approved on April 6, 2007. MW-A was identified as the up-gradient well, MW-B was down-gradient of the clarifying pond, and MW-C was down-gradient of the process pond.

During the 2007 VPDES permit issuance a groundwater evaluation was performed using data from 2001 onward. The 2007 evaluation is included in this attachment. The predominate finding was that the wells down gradient of the treatment units were being impacted by the mining operation and that concentrations of most pollutants were lower at down gradient wells, presumed to be a result of groundwater dilution due to pond leakage. pH was also noted to be statistically significantly lower at the down gradient wells. Due to these findings, the 2007 VPDES permit required submittal of a corrective action plan (CAP).

Upon permit issuance, Iluka responded to the CAP requirement by a letter stating that the low groundwater pH was due to natural soil characteristics and that a CAP was not warranted. In December of 2008 Iluka submitted a closure plan for the Hickory plant, in anticipation of its decommissioning in 2009. On December 19, 2008 DEQ conditionally approved the closure plan with the stipulation that plans for continued groundwater monitoring be discussed further (refer to **Attachment I** for a copy of the closure plan). DEQ and Iluka met on February 10, 2009 to discuss the groundwater issues at Hickory and the closure of the plant. Refer to the February 26, 2009 memo, attached, for details of the meeting. At the meeting DEQ recommended that Iluka perform a permeability test on the process and clarifying ponds to support their claim that the ponds were not responsible for the low down-gradient pH and groundwater degradation.

On January 21, 2011 Iluka and DEQ met again to discuss the Hickory plant. Iluka verbally reported the results of the permeability test and stated that the permeability test on the process water pond passed, while the permeability test on the clarifying pond failed. Refer to the 1/21/2011 meeting minutes (included in this attachment) for specifics discussed at the meeting. At the meeting it became clear that mining activity had occurred all around MW-A, rendering it inadequate as an up-gradient well due to the possibility that groundwater in that well may have been impacted by the mining activity. As a result of the meeting, DEQ recommended that a new up-gradient well be installed, that MW-A be closed, and continued monitoring be performed throughout the reclamation of the site and until DEQ evaluation of the data shows that the groundwater is no longer degraded. On July 20, 2011 Iluka submitted a proposal to relocate the up-gradient well to a location up-gradient of all mining activity. DEQ approved the relocation proposal on August 9, 2011, and the new well, t HMW-A2, was installed on the northwestern edge of the site in the third quarter of 2011. With the well relocation, DEQ also stipulated that the groundwater monitoring frequency be increased to quarterly.

Groundwater Monitoring Data Summary 2007-2011 (collected under the old groundwater monitoring plan):

Due to the closure of the former up-gradient well (MW-A) and the fact that mining had occurred all around it making it unsuitable to use as a true up-gradient and un-impacted background well, statistical analysis of the difference between pollutant concentrations at MW-A as compared to the down gradient wells (MW-B and MW-C) during the 2007-2012 permit term is not constructive. Tables 2-4 in the Appendix display a basic summary of the semi-annual groundwater monitoring data collected from 2007 until the approval of the revised groundwater monitoring plan and relocation of the background well in the third quarter of 2011.

At MW-A, the former up-gradient well, sodium, TDS, and pH were present at values within the applicable standard. A positive trend is apparent in the TSS, pH and temperature data, while the specific conductivity and sodium concentrations in the up-gradient well appear to be decreasing over time. Monitoring at this well ceased after the first semi-annual sample of 2011 and the well has been decommissioned. Refer to Table 2 for the data summary.

At MW-B, most notably, all pH values were below the lower bound of the groundwater standard (5.5 SU). However, the time series analysis yielded a slight positive trend in the numbers, meaning the pH may be migrating toward a more neutral value. With the reclamation of the process water ponds and the removal of the presumed source of the low pH, it is expected that the groundwater may stabilize over time. The 4th quarter 2011 result for pH at MW-B, displayed in Table 1, was 4.76 SU, representing a slight increase over the course of 2011. The continued and more frequent monitoring required by the proposed 2012 permit and the revised groundwater monitoring plan will allow DEQ to further assess the groundwater contamination over the next permit term. Refer to Table 3 for the data summary.

The data summary provided in Table 4 documents that the pH values at MW-C also were below the lower bound of the groundwater standard (5.5 SU) from 2007 onward. As with MW-B, a slight positive trend is apparent over time, an indication that the groundwater may be recovering. The

pH at the well remained stable throughout 2011, with the fourth quarter 2011 value remaining at 4.88 SU (see Table 1 below). Sodium and TDS concentrations were below the applicable groundwater standard and exhibit no trend at this well. A groundwater standard for specific conductivity, TSS and temperature is not available, although all of these parameters appear to be increasing over time. Refer to Table 4 for the data summary.

Groundwater Monitoring Data Summary 4th Quarter 2011 to present (collected under the new groundwater monitoring plan):

The fourth quarter of 2011 marks the first monitoring period covered under the amended groundwater monitoring plan. With the 2012 permit reissuance, continued groundwater monitoring is required with the objective of reevaluation once a statistically significant dataset has been obtained. Reclamation of the process pond and clarifying pond began with the closure of the site in 2009 and the final discharge via Outfall 001 occurred in October of 2011. The ponds have since been filled in and the area around the ponds reclaimed. With the removal of the alleged pollution source, natural attenuation of pollutant concentrations and recovery of groundwater is anticipated over time. The fourth quarter data for each well is presented in Table 1.

Table 1. Summary of Groundwater Data for 2011 Quarter 4

Parameter	**MW-A2**	**MW-B**	**MW-C**	**Standard**
Specific Conductivity (umhos/cm)	350	103	127	NA
Sodium (mg/L)	6.2	6.6	5.9	270
TDS (mg/L)	122	78	84	1000
TSS (mg/L)	136	272	2082	NA
Temperature (^{o}C)	17.8	17.6	18.4	NA
pH –field (SU)	5.08	4.76	4.88	5.5-8.5

Recommendation:

Continued monitoring is recommended. More data collection is necessary to perform a statistical evaluation and trend analysis utilizing information collected at the relocated background well. Reevaluation will be performed at a later date. Groundwater monitoring should continue until such time as the permit is terminated.

APPENDIX

Table 2. MW-A (former up-gradient well decommissioned in 2011) data summary

Monitoring Period	**Specific Conductivity (umhos/cm)**	**Sodium (mg/L)**	**TDS (mg/L)**	**TSS (mg/L)**	**Temperature (°C)**	**pH- field (SU)**
2007 Quarter 4	507	108	300	168.9	16.8	5.95
2008 Quarter 2	550	71.0	254	14	16.9	6.10
2008 Quarter 4	393	73.3	166	86	17.5	6.01
2009 Quarter 2	338	57.8	177	219	16.5	6.27
2009 Quarter 4	321	59.8	308	935.2	17.3	6.48
2010 Quarter 2	339	81.8	218	611	19.1	6.52
2010 Quarter 4	281	54.5	232	308.8	18.1	6.60
2011 Quarter 2	243	42.7	280	337.2	19.1	6.30
Standard	**NA**	**270**	**1000**	**NA**	**NA**	**5.5 – 8.5**
Times Series Trend	Declining	Declining	Neutral	Increasing	Increasing	Increasing
R^2 value (correlation coefficient)	0.8449	0.5542	0.0004	0.2262	0.6378	0.6426

Table 3. MW-B data summary

Monitoring Period	**Specific Conductivity (umhos/cm)**	**Sodium (mg/L)**	**TDS (mg/L)**	**TSS (mg/L)**	**Temperature (°C)**	**pH- field (SU)**	**TPH-gas (mg/L)**	**TPH-Diesel (mg/L)**
2007 Quarter 4	57.7	9	<10*	408	15.9	4.28	<1	<1
2008 Quarter 2	265	8.5	46	158.3	18.1	4.71	<1	<1
2008 Quarter 4	106.4	6.2	< QL*	20	16.4	4.68	<1	<1
2009 Quarter 2	88.5	7.7	26	204	17.4	4.59	<0.5	<0.5
2009 Quarter 4	101.6	7.5	54	620	16.6	4.71	<1	<1
2010 Quarter 2	95.8	8.82	27	239	19.8	4.74	<1	<!
2010 Quarter 4	83	7.2	16	91.2	16.2	4.45	<1	<1
2011 Quarter 2	84.4	8.5	100	303.2	21	4.74	<1	<1
Standard	**NA**	**270**	**1000**	**NA**	**NA**	**5.5 – 8.5**	**1**	**1**
Times Series Trend	Declining	Declining (slight)	Increasing (slight)	Neutral	Neutral	Increasing	NA	NA
R^2 value (correlation coefficient)	0.0906	0.0719	0.0115	0.0051	0.0638	0.0736	NA	NA

*For the time series analysis the <QL values were treated as equivalent to the QL, or 10 mg/L.

Table 4. MW-C data summary

Monitoring Period	**Specific Conductivity (umhos/cm)**	**Sodium (mg/L)**	**TDS (mg/L)**	**TSS (mg/L)**	**Temperature (°C)**	**pH- field (SU)**
2007 Quarter 4	94.8	7	48	13	16.1	4.31
2008 Quarter 2	93.5	6.23	46	82.7	17.1	4.74
2008 Quarter 4	Well dry	Well dry	Well dry	Well dry	Well dry	Well dry
2009 Quarter 2	118.2	6.2	58	184	16	4.65
2009 Quarter 4	187.4	61	138	588.7	17.3	4.8
2010 Quarter 2	101.9	5.3	41	288	18.6	4.91
2010 Quarter 4	110.8	6.9	30	70.8	16.5	4.6
2011 Quarter 2	107.6	8.2	58	5971	20.4	4.88
Standard	**NA**	**270**	**1000**	**NA**	**NA**	**5.5 – 8.5**
Times Series Trend	Increasing (slight)	Neutral	Neutral	Increasing	Increasing	Increasing
Times Series Trend	0.0409	0.0039	0.0002	0. 3498	0.4304	0.4166

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY

4949-A Cox Road Glen Allen, VA 23060 **804/527-5020**

SUBJECT:	Request for Approval for the Relocation of HMW-A (Up-gradient well)
Facility	Iluka Resources Inc. – Hickory Mine Concentrator (VA0092126)
TO:	Curt Linderman, PRO Water Permits Manager
FROM:	Janine Howard, PRO Water Permit Writer
DATE:	August 9, 2011

Iluka Resources Inc. has submitted a letter dated July 20, 2011 with a revised proposal to relocate the up-gradient well at the Hickory Mine Concentrator site in Dinwiddie County. During the January 21, 2011 meeting between DEQ and Iluka (see Iluka-DEQ meeting minutes 1.21.2011) it was determined that the existing up- gradient well (HMW-A) is no longer an un-impacted background well due to mining activity that has occurred all around it. Iluka agreed to submit a plan to relocate the background well to an un-impacted location so that groundwater monitoring and evaluation of the impacts of the mineral mining on groundwater quality may continue to be evaluated. The new location for the background well must be up-gradient of and isolated from the impacts of mining activity. The original relocation proposal was received on April 11, 2011. Following review, DEQ indicated to Iluka that the proposed location for the new up-gradient well, termed HMW-A2, was not appropriate as it was down-gradient of mining activity that had occurred north of the treatment ponds. In response, Iluka submitted the revised proposal in July of 2011.

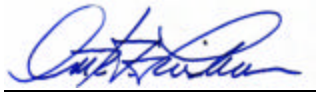
The revised letter proposes that HMW-A2 be located in the northwestern edge of the property. The proposed location is up-gradient of all mining activity and is hydogeologically up-gradient of HMW-B and HMW-C (the down-gradient wells). Groundwater monitoring data collected at this location should accurately characterize groundwater conditions absent of impact from mining/industrial activity.

Iluka proposes to monitor quarterly for conductivity, pH, sodium, total dissolved solids, total suspended solids, and temperature beginning with the third quarter of 2011. The identified parameters are consistent with the approved groundwater monitoring plan for the facility (approved April 6, 2007). The proposed monitoring frequency represents an increase in sampling frequency as compared to the semi-annual monitoring required by the approved plan. More frequent monitoring of the groundwater was suggested by DEQ in the January 2011 DEQ-Iluka meeting and is highly advisable.

Summary: The suggested location for HMW-A2 is on the northwestern edge of the facility, up-gradient of all mining activity. This location is up-gradient of all mining activity and will provide groundwater quality data that has not been affected by mining and industrial activity. The existing HMW-A will be abandoned in accordance with applicable regulations.

Staff Recommendation:
Staff recommends approval of the relocation of the background well (HMW-A2) as described in the July 20, 2011 letter and shown in the attached map. Monitoring frequency shall be quarterly.

Approved: Date:



October 18, 2011

ILUKA

Via Electronic Mail to Janine.howard@deq.virginia.gov and USPS

July 20, 2011

Ms. Janine Howard
Permit Writer
Department of Environmental Quality
Piedmont Regional Office
4949-A Cox Road
Glen Allen, VA 23060

RE: Request to Relocate Well HMW-A (Background Well) – VA0092126

Dear Ms. Howard:

Per our previous conversations, this letter is being submitted to request the relocation of the well identified as HMW-A at Iluka's Old Hickory Concentrator site in Dinwiddie County, Virginia. Due to previous mining activities, well HMW-A is now isolated on a knoll and is hindering reclamation activities which are required by the Virginia Department of Mines, Minerals and Energy, Division of Mineral Mining, Permit #90370AA. A proposed new location for the background well, which will be referred to as HMW-A2, has been chosen by utilizing the groundwater directional flow as determined by the three existing wells on site. A map is attached identifying the proposed new well location as well as the three existing wells.

Iluka proposes the new well will be installed consistent with the Hickory Groundwater Plan and be developed during the 3rd Quarter 2011. Water quality monitoring for Conductivity, Sodium, Total Dissolved Solids, Total Suspended Solids, Temperature, and pH will also commence in the 3rd Quarter 2011 from this new well . Iluka shall continue to conduct groundwater monitoring at the Old Hickory Concentrator site under the terms of the Revised Groundwater Monitoring Plan until reclamation of the site has been completed and DEQ review of the available groundwater monitoring data indicates all requirements of the 9 VAC 25-280, Virginia Groundwater Standards regulation are satisfied, or a revised Corrective Action Plan is approved and implemented per the agency's satisfaction. Quarterly monitoring shall continue for the term of the permit, unless DEQ approval to cease monitoring has been granted.

The current background Monitoring Well HMW-A will be abandoned consistent with established and applicable Virginia Regulations.

If you have any questions or require additional information or clarification, please contact me at the numbers listed below or via email at Kevin.rideout@iluka.com.

Iluka Resources Inc. – VA Operations
12472 St. John Church Rd., Stony Creek, VA 23882
Phone: 434.348.4300 Fax: 434.246.3039

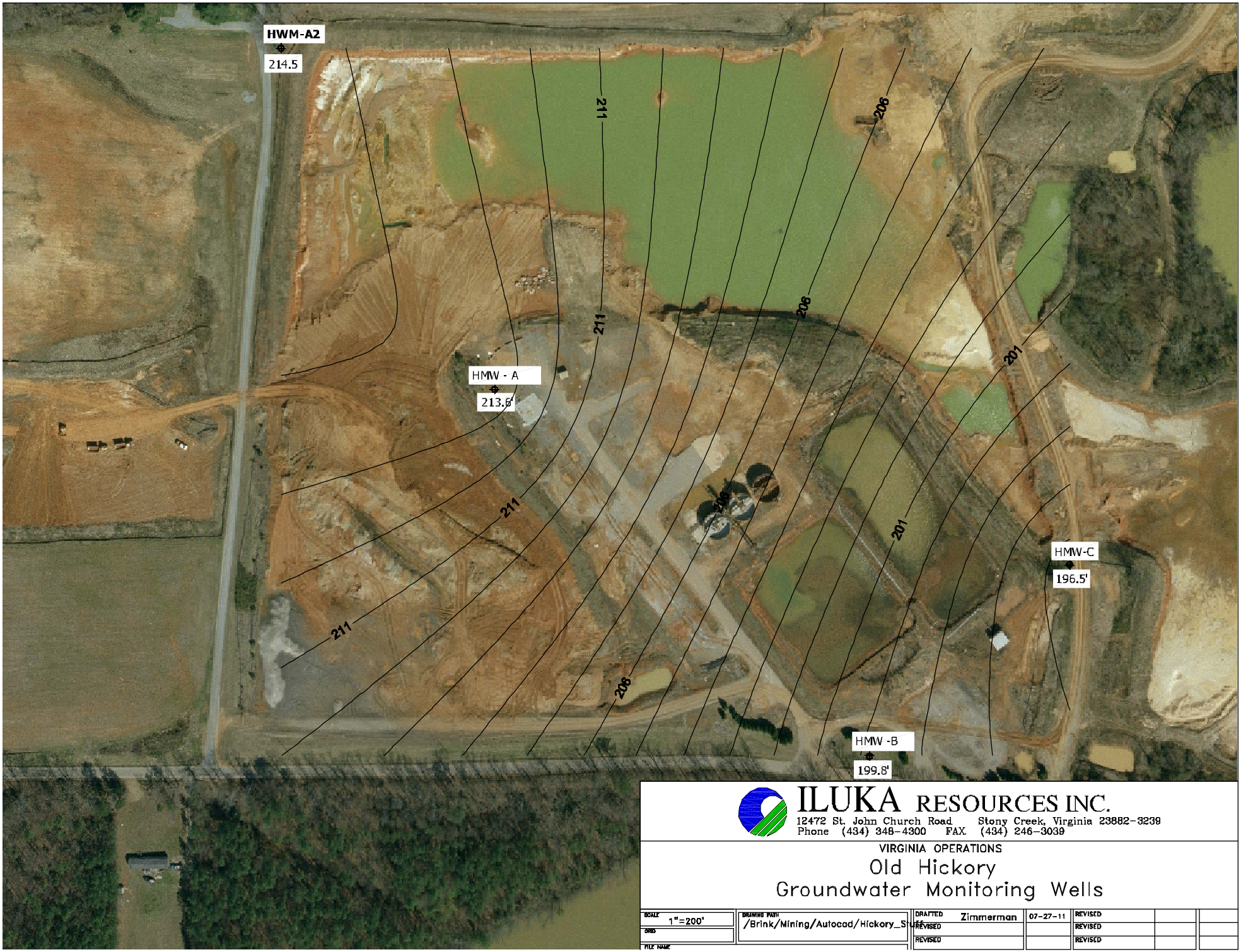
ILUKA

Regards,

Kevin Rideout

Kevin Rideout
EHS Specialist
Iluka Resources Inc. – VA Operations
434.348.4316 Office
804.721.7312 Mobile

Attachment:
Site map with Monitoring Wells indentified



ILUKA RESOURCES INC.
12472 St. John Church Road Stony Creek, Virginia 23882-3239
Phone (434) 348-4300 FAX (434) 246-3039

VIRGINIA OPERATIONS

Old Hickory
Groundwater Monitoring Wells

SCALE 1"=200'	DRAWING PATH /Brink/Mining/Autocad/Hickory_Surf...	DRAFTED Zimmerman	07-27-11	REVISED		
GRID		REVISED		REVISED		
FILE NAME		REVISED		REVISED		

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office

4949-A Cox Road, Glen Allen, VA 23060-6296 **804/527-5020**

SUBJECT: **Meeting to discuss Brink Mine Concentrator (VA0092436) GW monitoring plan and Hickory Mine Concentrator (VA0092126) permeability test results and site closure (10:00am, 1/21/2011)**

TO: **FILE**

FROM: **Janine Howard**

DATE: **January 21, 2011**

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On Friday, January 21, 2011, Curt Linderman and I met with Kevin Rideout, Jack Rayburn, Chuck Stilson, and Clint Zimmerman of Iluka Resources, Inc. The meeting was scheduled to discuss the Brink Mine Concentrator Groundwater Monitoring plan and as a follow-up to the February 10, 2009 meeting with Iluka, in which DEQ-PRO's requirements for corrective action and the closure of the Hickory site were discussed.

Topic 1:
Facility: Brink Mine Concentrator
Permit Number: VA0092436
Expiration Date: 4 May 2015

The Brink Mine permit was issued on May 5, 2010. This was the first issuance for this particular facility and Part I.C.7 of the permit required the development of a groundwater monitoring plan within 90 days of the effective date of the permit. The first submission was received on time (7/19/2010) and was subsequently revised on 10/14/2010 and 12/17/2010. The third revision contained plans for three down-gradient wells and one up-gradient well (MW-1). MW-1 is located at the rear entrance of the plant. MW-2 is down-gradient of the process water pond (just east of the divide between the process water pond and the clarifier pond), and MW-3 is down-gradient of the concentrator building and fuel farm. MW-4 is down-gradient of the clarifying pond. The monitoring plan does not include a well down-gradient of the sedimentation/stormwater basin. It was DEQ's position that the locations of the proposed wells were not adequate to capture potential leakage from the sediment basin. Iluka then requested the meeting to discuss the groundwater plan.

Iluka and DEQ discussed the positioning of the down-gradient monitoring wells that would best allow for the characterization and isolation of potential contamination from each of the individual treatment units. MW-3 was thought to be advantageously located down-gradient of the concentrator plant and fuel farm and the positioning of this well was not contentious. The proposed location for MW-4, down-gradient of the clarifying pond was thought to be well positioned to capture potential impact from the clarifying pond. DEQ voiced concern that there was no well in place to capture potential contamination from leakage of the sediment basin. The positioning of MW-2 was also discussed with reference to its location in between both the clarifying pond and the process water pond. DEQ and Iluka agreed that the positioning of the well (MW-2) is not ideal in terms of identifying the source of potential leakage; if monitoring data from this well indicated that there was contamination of the groundwater, due to the location of MW-2, determining whether the source was the clarifying pond or process pond would likely require further investigation. The discussion shifted to a location for a fifth well (henceforth referred to as MW-5) that would serve to identify leakage from the process water pond and the sediment basin. A location for MW-5 just west of the sedimentation basin and down-gradient of the process water pond was determined to be an adequate location for the well in order to capture leakage from the sediment basin and the process water pond. Both DEQ and Iluka appeared satisfied with the
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proposed position of MW-5.

The discussion then shifted to whether all four discussed down-gradient wells were needed in the revised groundwater plan. Iluka and DEQ agreed that, due to its ambiguous location, MW-2 did not need to be included in the revised plan if MW-5 were to be installed. MW-2 will not be closed out, but rather retained for back-up monitoring on an as-needed basis, depending upon results of the groundwater monitoring. Should MW-5 or MW-4 indicate contamination, Iluka, at their discretion, may resume monitoring at MW-2 to aid in pinpointing the extent and source of the plume. The placement of MW-1, the up-gradient well, was not discussed.

This section of the meeting concluded with the resolution that the resubmitted groundwater plan shall include monitoring at MW-1, MW-3, MW-4, and MW-5. Iluka agreed to resubmit the groundwater plan for DEQ approval with the discussed changes.

Topic 2:
Facility: Hickory Mine Concentrator
Permit Number: VA0092126
Expiration Date: 12 November 2012

Iluka wanted to discuss the closure process of the Hickory Site; the results of permeability tests which were conducted on the two process water ponds at the Site were central to this discussion. This portion of the meeting was in follow-up to the February 10, 2009 meeting with Iluka, in which DEQ-PRO's requirements for corrective action and the closure of the Hickory site were discussed. See Attachment 1 for a summary of the February 10, 2009 DEQ-Iluka meeting and the decision-making conducted prior to the permeability tests being carried out. The permeability tests were recommended by DEQ based on Iluka's argument that the soil around their plants has low pH and that their operations are not degrading the groundwater or contributing to low the pH values. DEQ asserts that Iluka has contributed to the contamination of the groundwater on site; staff analyses of the groundwater monitoring data for this facility indicate that there is a significant difference in downgradient pH concentrations at the site. The permeability tests were suggested as a means for Iluka to demonstrate that the treatment units at the site are not leaking and support their theory that the low pH results from the groundwater monitoring is not due to their operations.

The Hickory site groundwater monitoring plan consists of three wells, HMW-A, HMW-B, and HMW-C. HMW-A is the up-gradient well, HMW-B is situated down-gradient of the clarifying pond and HMW-C is down-gradient of the process water pond. A Corrective Action Plan (CAP) was required in the VPDES permit (VA0092126) issued November 13, 2007 due to the down-gradient pH being significantly different than the groundwater pH in the up-gradient well. Iluka responded to the CAP requirement with a letter stating that they did not believe their operations were contributing to the low pH in the groundwater. At this meeting, Iluka informed DEQ that since the establishment of the groundwater monitoring plan, the area around HMW-A has been mined. DEQ then discussed the ramifications of the mining activity around the up-gradient well; the validity of HMW-A as an appropriate background well is moot as a result of the mining activity around it.

Following the 2009 meeting Iluka conducted liner permeability tests on both the process water pond and the clarifying pond. Iluka Resources did not supply DEQ with hard copy results of the permeability tests at the meeting. Iluka stated that the permeability test on the process water pond passed, while the permeability test on the clarifying pond failed. The following discussion and options presented by DEQ were made on the premise that the permeability test shows leakage of the clarifying pond.

Iluka seeks to begin land reclamation at the site and asked for DEQ's approval to proceed following the failed permeability tests. DEQ agreed that the land reclamation may proceed so long as the groundwater monitoring continues. DEQ stated that a revised CAP should be submitted, following the failed permeability tests, to outline the remedial action Iluka will take to return down-gradient groundwater pH concentration to background levels.

DEQ outlined a number of options that Iluka could include in their CAP. The first option is for the land reclamation to proceed as planned. This would require the abandonment of HMW-A, with a new up-

gradient well being established following the completion of the land reclamation. Iluka was informed that this option would likely result in the need for the permit to be renewed so as to gather enough groundwater data to generate a statistically significant dataset in order for reevaluation of the data. This option would rely on the natural attenuation of the pH to background levels over time and the permittee may choose to simply continue monitoring until this occurs. Another option presented is for the permittee to actively remediate the contaminated groundwater to return it to background levels. Iluka may also choose to perform a risk-assessment of the contamination, taking into consideration the beneficial uses of the resource. In conjunction with the landowner Iluka may enter into a risk-based compensation agreement with the landowner acknowledging the contamination of the groundwater. Following this discussion Iluka confirmed with DEQ that any of the aforementioned options could be employed and incorporated into the revised CAP.

Iluka requested information on the appeal process. DEQ explained the Early Dispute Resolution process and said that if Iluka wanted to pursue this route that they should direct the request to the Regional Director. The meeting concluded at approximately 11:40am.

Attachment 1: February 10, 2009 DEQ-Iluka Meeting Minutes

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office

4949-A Cox Road, Glen Allen, Virginia 23060-6295
804/527-5020

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TO: file
FROM: Jaime Bauer
DATE: February 26, 2009
SUBJECT: Meeting to discuss Iluka Resources Inc – MSP (VA0090981) and Old Hickory (VA0092126) Corrective Action Plans, Groundwater Monitoring results, and Site Closure
COPIES: --

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On Tuesday, February 10, 2009, Curt Linderman and I met with John Allen and Jack Rayburn from Iluka and Mike Williams (Golder Associates). The meeting was scheduled to discuss issues related to groundwater monitoring results, DEQ-PRO's requirements for corrective action plans, and closure of the Old Hickory site.

At both of the subject facilities, groundwater monitoring results demonstrate low pH around the Iluka sites. It is the position of Iluka documented in numerous correspondence that the soil around their plants typically has low pH and that their operations are not impacting the groundwater pH. However, DEQ-PRO staff analyses of the groundwater monitoring data has indicated that a significant different exists on the Iluka sites between samples taken from wells up gradient of the process ponds and those samples taken at wells down gradient.

After reviewing the 2008 third quarter groundwater monitoring results for the MSP site, DEQ required Iluka to submit a corrective action plan due to pH values that were lower than the minimum groundwater standard for pH of 5.5 S.U. Additionally, evaluation of the pH data showed a significant difference at wells up gradient and down gradient of the MSP ponds. During our discussions it was discovered that in evaluating the significant difference the wrong well was used as the background. DEQ-PRO agreed to re-evaluate the data.

In letters dated October 22, 2008 and December 18, 2009, Iluka requested approval of the closure plan for the Old Hickory Site. DEQ conditionally approved the closure on December 19, 2008 pending the subject meeting to discuss groundwater monitoring. On September 22, 2008, DEQ-PRO approved a corrective action plan for the Old Hickory site that included continued monitoring of groundwater wells. It is DEQ's contention that groundwater monitoring shall continue on the site until such time that DEQ is confident the groundwater was not impacted by the Old Hickory operations or that appropriate corrective actions were implemented and there is no risk to human health or water supplies. Iluka's was uncomfortable with DEQ's position, because of the limited time left on the land leases. Iluka contends that they will not have access and rights to the property after the leases have expired therefore they should not have to continue performing the groundwater monitoring.

In order to demonstrate that the process pond at the Old Hickory site is not leaking, it was recommended that Iluka perform a liner permeability test since the site is closing down and the ponds are being drained. If the liner is shown to fail the permeability test, then it can be inferred that the pH issues are coming from the Iluka operations and the groundwater should continue to be monitored until such time that natural attenuation has occurred and the DEQ-PRO is satisfied that the groundwater pH is no longer a concern. If the liner passes the test, then Iluka has evidence to support their theory that the low pH is not coming from their operations. It is important to note that since the site is being closed a ponds as a potential source of the pH will be removed.

2007 Groundwater Evaluation

Groundwater Sampling Evaluation

Background

Iluka's Old Hickory Concentrator has had a groundwater monitoring program since 2001. Sampling was done at 1 up-gradient well and 3 down-gradient wells. All wells were placed into the surficial aquifer and sampling has been done as described in the groundwater monitoring plan approved in September 2000.

PMW-A is the background well while PMW's B, C and D are down gradient from the facility.

Comparisons were done using annual data from April 2001 through February 2006. Data from each down-gradient well was compared to PMW-A using an in house spread sheet, which uses Cochran's Approximation to the Behrens-Fisher Students t-Test (at a 5% level of Significance). Data from individual wells was also plotted and trend analysis was completed using the graphing function in MS Excel.

Evaluation of data from PMW-A (Background)

Specific Conductance: Regression analysis reveals a weak upward trend with an R^2 value of 0.155. There is no groundwater standard for Specific Conductance.

Sodium: Regression analysis reveals a weak upward trend with an R^2 value of 0.007. The groundwater standard for Sodium is 270 mg/l and this well has average of 78.6 mg/l with a maximum of 140.

Total Dissolved Solids: Regression analysis reveals a weak upward trend with an R^2 value of 0.096. There is no groundwater standard for TDS but the groundwater criteria in the Piedmont Physiographic province is 250 mg/l. The average for the groundwater in this well was 278 mg/l and the maximum was 516.

Total Suspended Solids: Regression analysis reveals a weak downward trend with an R^2 value of 0.031. There is no groundwater standard for TSS.

pH: Regression analysis reveals a weak upward trend with an R^2 value of 0.036. The groundwater standard for pH in the Piedmont Physiographic province is 5.5-8.5. The average for the groundwater in this well was 5.82, with a minimum of 4.97.

Volatile and Semi-volatile Organics: In the approved groundwater monitoring plan, the permittee proposed monitoring the up gradient well (PMW-A) for a list of volatile and semi-volatile organics. Review of the data submitted revealed data points above QL for Methylene chloride, Bis(2-ethyhexyl) phthalate, Dibutyl phthalate and Diethyl phthalate. Research reveals that phthalates are plasticizers used in many forms of plastic, including PVC pipe and plastic sampling equipment and the methylene chloride is used as a paint stripper and degreaser. There are no groundwater standards for these parameters and all data points were below the State Surface Water Quality Standards. The facility is not considered a source of these chemicals and no further investigation is required.

Evaluation of data from PMW-B

Specific Conductance: The t-test indicates a significant decrease over background while regression analysis reveals a weak upward trend with an R^2 value of 0.028. There is no groundwater standard for Specific Conductance.

Sodium: The t-test indicates a significant decrease over background while regression analysis reveals a weak upward trend with an R^2 value of 0.146. The groundwater standard for Sodium is 270 mg/l and this well has average of 5 mg/l with a maximum of 6.4.

Total Dissolved Solids: The t-test indicates a significant decrease over background while regression analysis reveals a weak upward trend with an R^2 value of 0.047. There is no groundwater standard for TDS but the groundwater criteria in the Piedmont Physiographic province is 250 mg/l. The average for the groundwater in this well was 84 mg/l and the maximum was 608.

Total Suspended Solids: The t-test indicates no significant difference between the two wells while regression analysis reveals a weak downward trend with an R^2 value of 0.056. There is no groundwater standard for TSS.

pH: The t-test indicates a significant decrease over background while regression analysis reveals a level trend with an R^2 value of 0.002. The groundwater standard for pH in the Piedmont Physiographic province is 5.5-8.5. The average for the groundwater in this well was 4.86, with a minimum of 3.84.

Evaluation of data from PMW-C

Specific Conductance: The t-test indicates a significant decrease over background while regression analysis reveals a weak downward trend with a R^2 value of 0.110. There is no groundwater standard for Specific Conductance.

Sodium: The t-test indicates a significant decrease over background while regression analysis reveals a weak downward trend with an R^2 value of 0.044. The groundwater standard for Sodium is 270 mg/l and this well has average of 10.5 mg/l with a maximum of 20.9.

Total Dissolved Solids: The t-test indicates a significant decrease over background while regression analysis reveals a weak upward trend with an R^2 value of 0.031. There is no groundwater standard for TDS but the groundwater criteria in the Piedmont Physiographic province is 250 mg/l. The average for the groundwater in this well was 72 mg/l and the maximum was 122.

Total Suspended Solids: The t-test indicates no significant difference over background while regression analysis reveals a weak downward trend with an R^2 value of 0.056. There is no groundwater standard for TSS.

pH: The t-test indicates a significant decrease over background while regression analysis reveals a level trend with an R^2 value of 0.005. The groundwater standard for pH in the Piedmont Physiographic province is 5.5-8.5. The average for the groundwater in this well was 5.18, with a minimum of 4.50.

Evaluation of data from PMW-D

Specific Conductance: The t-test indicates a significant decrease over background while regression analysis reveals a downward trend with an R^2 value of 0.37. There is no groundwater standard for Specific Conductance.

Sodium: The t-test indicates a significant decrease over background while regression analysis reveals a downward trend with an R^2 value of 0.627. The groundwater standard for Sodium is 270 mg/l and this well has average of 11.6 mg/l with a maximum of 26.5.

Total Dissolved Solids: The t-test indicates a significant decrease over background while regression analysis reveals a weak upward trend with an R^2 value of 0.056. There is no groundwater standard for TDS but the groundwater criteria in the Piedmont Physiographic province is 250 mg/l. The average for the groundwater in this well was 62 mg/l and the maximum was 108.

Total Suspended Solids: The t-test indicates no significant difference between the two wells while regression analysis reveals a weak downward trend with an R^2 value of 0.077. There is no groundwater standard for TSS.

pH: The t-test indicates a significant decrease over background while regression analysis reveals a weak level trend with an R^2 value of 0.036. The groundwater standard for pH in the Piedmont Physiographic province is 5.5-8.5. The average for the groundwater in this well was 5.23, with a minimum of 4.31.

Discussion

Analysis indicates that the wells down gradient of the facility are being affected by the operation. The affect is different than what is normally experienced, as the concentrations of the parameters are significantly less than what exists in the background well. This is interpreted as an indication of dilution of the groundwater from inputs by the clarifying and process ponds. A significant portion of the water used by the facility is from rainwater and water pumped from the Nottoway River which would explain the low Conductivity and low concentrations of the other parameters. The pH's were statistically significantly lower in the down gradient wells though the reason for this unknown.

Conclusion

In the initial permit issuance, the clarifying and processing water ponds were not required to be lined as they were considered to be much less of a threat to the groundwater than the mining pits, but groundwater monitoring was required as a precaution. As the ponds appear to be contributing to the groundwater and the pH of the downgradient wells is not only significantly lower than the upgradient well but below the State Groundwater Standard for the Piedmont Physiographic province as well, it is recommended that Iluka produce a Corrective action plan.

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

PIEDMONT REGIONAL OFFICE
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L. Preston Bryant, Jr.
Secretary of Natural Resources

David K. Paylor
Director

Gerard Seeley, Jr.
Regional Director

April 6, 2007

Mr. Jack Rayburn
Environmental Health and Safety Officer
Iluka Resources Inc.
12472 St. Johns Church Rd.
Stony Creek, VA 23882-3039

RE: Groundwater monitoring plan for VPDES Permit No. VA0092126 – Hickory Mine Concentrator

Dear Mr. Rayburn:

The proposed groundwater monitoring plan received at this office on April 2, 2007 is approved as part of the requirements for the issuance of the referenced permit.

If you have any questions, please contact me at (804) 527-5081 or cdchamberlain@deq.virginia.gov.

Sincerely,

Corwin Chamberlain
Environmental Specialist II

ILUKA

PROPOSED GROUNDWATER MONITORING PLAN
ILUKA RESOURCES INC.
OLD HICKORY MINE CONCENTRATOR SITE

The Old Hickory Mine Concentrator operated by Iluka Resources is a mineral sands concentrating facility located in Dinwiddie County at 19540 Bolster Road, Stony Creek, Virginia. This proposed groundwater monitoring plan is being submitted in partial fulfillment of the requirements of VPDES Permit # VA0092126.

GROUNDWATER MONITORING PLAN

Iluka proposes to monitor the surficial water-table at the Old Hickory site using an existing system of monitoring wells. The details of the system are described in the following sections.

Well Construction and Installation Details

It is proposed that shallow water-table monitoring at the Old Hickory Concentrator site be conducted using three existing monitoring wells originally installed at the site in fulfillment of Special Condition No. 4 of Virginia Pollution Abatement (VPA) Permit #00563. The rational for the placement of these wells is summarized in Table 1.

The wells were installed at a depth of 25 feet. Depth to water, well installation stick-up and penetration into the water-table are listed in Table 2. The wells were constructed of 2 inch diameter Schedule 40 threaded PVC well screen (0.010 inch machine slot) and casing. Each well was constructed so that a minimum of 5 feet of well casing extends below grade, which left adequate vertical space for the installation of a proper well seal. The annular space around the well screen was filled with a filter pack of clean 20-30 silica sand to within 1 foot of the top of the screened section. A 1 to 2 foot thick hydrated bentonite seal was installed above the filter pack. Finally, a minimum of 1 foot of Type-I neat cement grout containing 5% bentonite was placed above the bentonite seal.

The wells are finished at the surface as above-grade installations and consist of the PVC well screen, capped with a 2 inch diameter Torquer well cap, surrounded by a protective metal casing with an attached cap. The cap is secured with a padlock, the key to which is in the possession of the EHS Department. Two of the wells are set in a 3 foot square concrete pad, the remaining well is protected by three concrete filled, steel pipe bollards, 4 inches in diameter. A map of the Old Hickory Concentrator site, showing the locations of the proposed monitoring wells and surface topography contours is included as Figure 1.

Sampling Frequency and Analytes

The proposed sampling frequency and analyses for each well are shown in Table 3. All wells on the concentrator site will be analyzed semi-annually for pH, total dissolved solids (TDS), total suspended solids (TSS), sodium (Na), and conductivity. In addition, since MW-B is located down gradient from areas where hydrocarbon fuels and lubricants are stored, it will be sampled and analyzed semi-annually for diesel range organics (DRO) and gasoline range organics (GRO) using EPA method 8015.

REPORTING

Following the completion of each sampling event, a semi-annual report will be submitted to the Virginia Department of Environmental Quality (VADEQ). This report will include a brief description of the wells sampled, a description of any unusual observations made during the sampling event, and a copy of the certified laboratory analytical report. The semi-annual report shall be submitted to the VADEQ within ten days following the end of each six month period. Table 4 presents a proposed timetable for sampling and reporting.

TABLE 1. RATIONALE FOR THE PLACEMENT OF MONITORING WELLS

MONITORING WELL ID.	RATIONALE
MW-A	Up-gradient of concentrator facility
MW-B	Down-gradient of clarifying pond; laterally at grade with the concentrate stacker and stacker turkey nest sump.
MW-C	Down gradient of process and storm-water ponds.

TABLE 2. DEPTH AND PENETRATION INTO WATER-TABLE BY MONITORING WELLS

MONITORING WELL ID.	STICK-UP (ft)	DEPTH TO WATER* (ft)	PENETRATION INTO WATER-TABLE (ft)
MW-A	1.9	17.5	9.4
MW-B	1.5	17.3	8.2
MW-C	1.3	17.9	8.4

* This measurement will vary according to climatic conditions. These depths were recorded on 3/30/2007.

TABLE 3. PROPOSED ANALYTES AND SAMPLING FREQUENCY

MONITORING WELL ID.	ANALYTES	FREQUENCY
MW-A	pH, TDS, TSS, Conductivity, Na	Semi-annual
MW-B	pH, TDS, TSS, Conductivity, DRO, GRO, Na	Semi-annual
MW-C	pH, TDS, TSS, Conductivity, Na	Semi-annual

TABLE 4. PROPOSED SAMPOING AND REPORTING TIMETABLE

MONITORING PERIOD	TYPE OF EVENT	SAMPLING EVENT DUE DATE	REPORT DUE DATE
JANUARY - JUNE	Semi-annual	JUNE 1	JULY 10
JULY DECEMBER	Semi-annual	DECEMBER 1	JANUARY 10

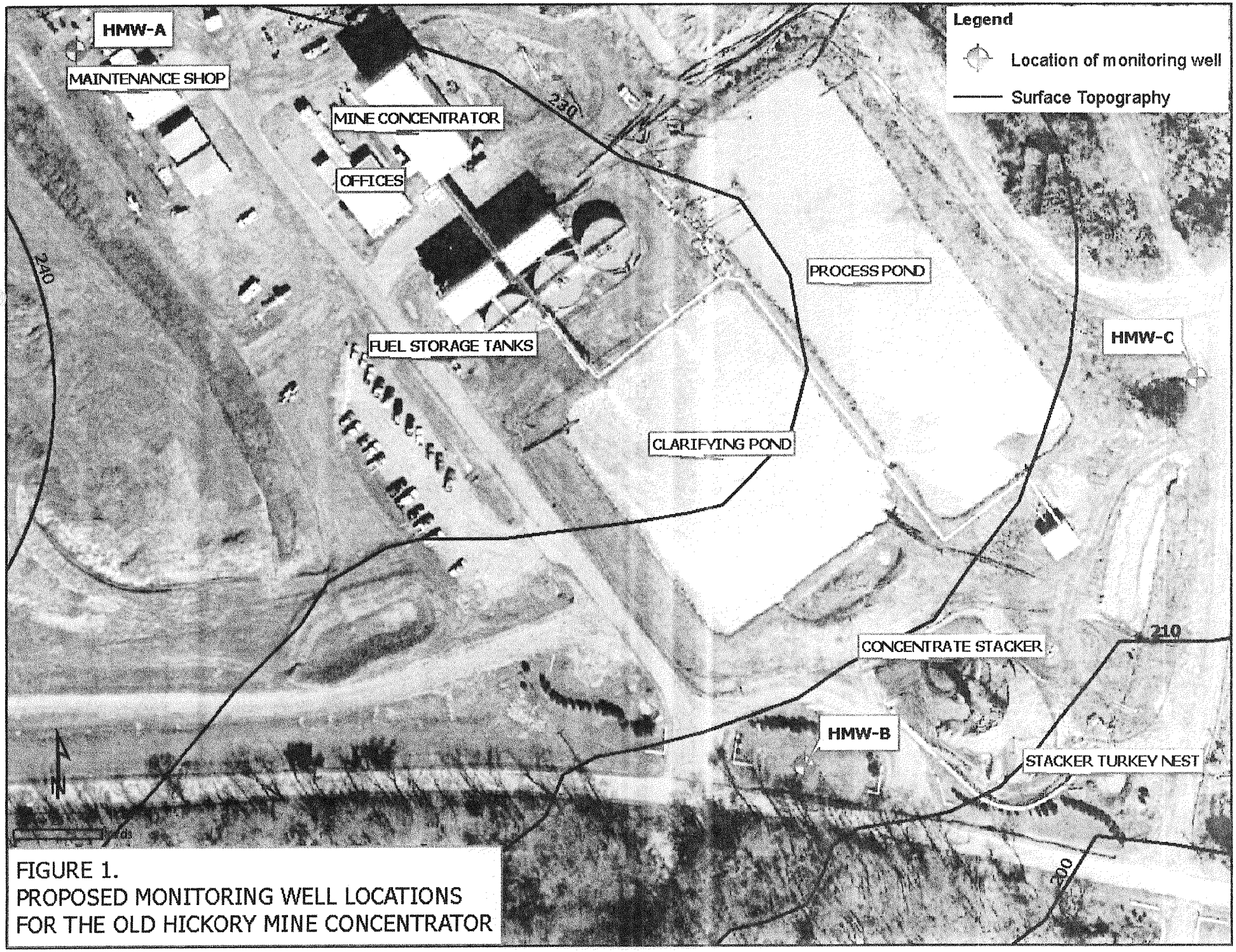

FIGURE 1.
PROPOSED MONITORING WELL LOCATIONS
FOR THE OLD HICKORY MINE CONCENTRATOR

Attachment H: Facility Closure Plan
(Conditionally approved 12/19/2008)

VA0092126
R/G R+

COMMONWEALTH of VIRGINIA

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Secretary of Natural Resources

David K. Paylor
Director

Gerard Seeley, Jr.
Regional Director

December 19, 2008

Mr. John Allen
Iluka Resources Inc.
12472 St. John Road
Stony Creek, Virginia 23882

RE: Closure Plan for Iluka Resources Inc – Old Hickory Concentrator, VA0092126

Dear Mr. Allen:

The Department of Environmental Quality – Piedmont Region staff has reviewed your letter dated December 18, 2008 proposing facility closure of the Old Hickory Concentrator site located at 19540 Bolsters Rd in Dinwiddie County. According to your letter, Iluka will begin decommissioning the structural components of the facility in January 2009. Discharge from Outfall 001 is expected to cease by the end of July 2009 at which time closure of the process ponds and Outfall 001 will commence. However, the closure plan does not address the semi-annual groundwater monitoring required by the VPDES permit.

Therefore, the DEQ conditionally approves the facility closure plan. Plans for groundwater monitoring at the facility during and after closure will be discussed in a meeting between DEQ and Iluka staff scheduled for January 13, 2009 and will be approved at a later time.

If you have any questions regarding this approval, please contact Ms. Jaime Bauer at 804-527-5015.

Sincerely,

Curtis J. Linderman, P.E.
Water Permit Manager

cc: file

ILUKA

Via email and USPS

December 18, 2008

Ms. Jaime Bauer
Environmental Specialist II
Department of Environmental Quality
Piedmont Regional Office
4949-A Cox Road
Glen Allen, VA 23060

RE: Proposed Facility Closure Plan for the Old Hickory Concentrator Site
VPDES Permit # VA0092126

Dear Ms. Bauer:

Part I, Section B.6 of the above referenced permit requires Iluka to develop a Closure Plan for the site to address liquid and sludge removal, odor control measures, structure and pipe removal, steps to prevent unauthorized access, fill materials, and final grading and seeding. This document is being presented to DEQ as the proposed Facility Closure Plan for the Old Hickory Concentrator Site.

Liquid and Sludge Removal
Process water from the Old Hickory Concentrator (the Facility) will be treated in the site's Process Water Ponds, and then pumped to Outfall 001 where it will be discharged to an unnamed tributary of Harris Swamp. Sludge removal will not be necessary as the Facility treats only process water. Municipal waste water has never been treated or stored in the Facility's ponds.

Odor Control Measures
Odors are not anticipated to be an issue during closure as the Facility treats only process water. Municipal waste water has never been treated or stored in the Facility's ponds.

Structure and Pipe Removal
Structural components of the Facility will be demolished by a contractor and sold as scrap metal. The Facility's piping, pumps, and controls will be cleaned onsite and transported to the new Brink Concentrator facility currently under construction near Emporia. VPDES permit applications for this new facility are currently being reviewed by DEQ.

Prevention of Unauthorized Access
Access to the site will be posted as restricted and a gate will be installed across the main entrance.

Fill Materials
The side walls of the Facility's elevated ponds will be re-graded once the ponds have been dewatered and have dried sufficiently. Additional fill material will not be required.

Iluka Resources Inc. – VA Operations
12472 St. John Church Rd., Stony Creek, VA 23882
Phone: 434.348.4300 Fax: 434.246.3039

ILUKA

Final Grading and Seeding
The land occupied by the Facility is under lease by Iluka. The site will be graded as close as possible to original topographic contours. The site will be reclaimed and seeded with a mixture of grasses and returned to the owner as pasture land in accordance with the terms of Iluka's DMME Mining Permit.

Proposed Schedule
Iluka plans to begin discharging treated process water in December 2008 in preparation for closure of the Facility. Structural components and most of the Facility's pumps and piping will be decommissioned January 12, 2009. Demolition will commence at that time. Discharge of treated process water from the Facility is expected to continue through July 2009. The Facility site is expected to be fully reclaimed by 2012.

Post Closure Monitoring
Post closure monitoring requirements will be determined at a future date.

If you have any questions or need additional information or clarification please contact me at the numbers listed below or via email at john.allen@iluka.com.

Regards,

John A. Allen
Environmental Officer
804-943-5611 (C)
434-348-4315 (O)

Cc: (PDF) Allan Sale, President and General Manager, US Region, Iluka Resources Inc.
(PDF) Chuck Stilson, Mine Manager, Iluka Resources Inc.
(PDF) Jack Rayburn, EHS&T Supervisor, Iluka Resources Inc.

Attachment I: NPDES Permit Rating Worksheet

NPDES PERMIT RATING WORK SHEET

NPDES No. VA0092126

☐Regular Addition
☐Discretionary Addition
☐Score change, but no status change
☐Deletion

Facility Name: Hickory Mine Concentrator

City: Dinwiddie County

Receiving Water: Harris Swamp, Unnamed tributary

Reach Number: N/A

Is this facility a steam electric power plant (SIC=4911) with one or more of the following characteristics?
1. Power output 500 MW or greater (not using a cooling pond/lake)
2. A nuclear power plant
3. Cooling water discharge greater than 25% of the receiving stream's 7Q10 flow rate
☐ YES; score is 600 (stop here) ☒ NO (continue)

Is this permit for a municipal separate storm sewer serving a population greater than 100,000?

☐YES; score is 700 (stop here)
☒NO (continue)

FACTOR 1: Toxic Pollutant Potential

PCS SIC Code: _____ Primary SIC Code: 1099 Other SIC Codes: _____
Industrial Subcategory Code: E (Code 000 if no subcategory)

Determine the Toxicity potential from Appendix A. Be sure to use the TOTAL toxicity potential column and check one)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
☒No process waste streams	0	0	☐ 3.	3	15	☐ 7.	7	35
☐ 1.	1	5	☐ 4.	4	20	☐ 8.	8	40
☐2.	2	10	☐ 5.	5	25	☐ 9.	9	45
			☐6.	6	30	☐ 10.	10	50

Code Number Checked: 0

Total Points Factor 1: 0

FACTOR 2: Flow/Stream Flow Volume (*Complete either Section A or Section B; check only one)*

Section A □ Wastewater Flow Only Considered

Wastewater Type (See Instructions)		Code	Points
Type I: Flow < 5 MGD	☐	11	0
Flow 5 to 10 MGD	☐	12	10
Flow > 10 to 50 MGD	☐	13	20
Flow > 50 MGD	☐	14	30
Type II: Flow < 1 MGD	☐	21	10
Flow 1 to 5 MGD	☐	22	20
Flow > 5 to 10 MGD	☐	23	30
Flow > 10 MGD	☐	24	50
Type III: Flow < 1 MGD	X	31	0
Flow 1 to 5 MGD	☐	32	10
Flow > 5 to 10 MGD	☐	33	20
Flow > 10 MGD	☐	34	30

Section B □ Wastewater and Stream Flow Considered

Wastewater Type (See Instructions)	Percent of instream Wastewater Concentration at Receiving Stream Low Flow		Code	Points
Type I/III:	< 10 %	☐	41	0
	10 % to < 50 %	☐	42	10
	> 50 %	☐	43	20
Type II:	< 10 %	☐	51	0
	10 % to <50 %	☐	52	20
	> 50 %	☐	53	30

Code Checked from Section A or B: 0

Total Points Factor 2: 0

FACTOR 3: Conventional Pollutants *(only when limited by the permit)* NA not limited in the permit

A. Oxygen Demanding Pollutant: (check one) ☐ BOD ☐ COD ☐ Other: _____

		Code	*Points*
Permit Limits: (check one)	☐	< 100 lbs/day	1	0
	☐	100 to 1000 lbs/day	2	5
	☐	> 1000 to 3000 lbs/day	3	15
	☐	> 3000 lbs/day	4	20

Code Checked: N/A

Points Scored: 0

B. Total Suspended Solids (TSS)
Based on TSS reported on app
32 mg/L X .031 MGD X 8.34 =

		Code	*Points*
Permit Limits: (check one)	X	< 100 lbs/day	1	0
	☐	100 to 1000 lbs/day	2	5
	☐	> 1000 to 5000 lbs/day	3	15
	☐	> 5000 lbs/day	4	20

Code Checked: 0

Points Scored: 0

C. Nitrogen Pollutant: (check one) ☐ Ammonia ☐ Other: _____NA not limited in the permit

		Nitrogen Equivalent	*Code*	*Points*
Permit Limits: (check one)	☐	< 300 lbs/day	1	0
	☐	300 to 1000 lbs/day	2	5
	☐	> 1000 to 3000 lbs/day	3	15
	☐	> 3000 lbs/day	4	20

Code Checked: N/A

Points Scored: 0

Total Points Factor 3: 0

FACTOR 4: Public Health Impact

Is there a public drinking water supply located within 50 miles downstream of the effluent discharge (this includes any body of water to which the receiving water is a tributary)? A public drinking water supply may include infiltration galleries, or other methods of conveyance that ultimately get water from the above referenced supply.

☐ YES (If yes, check toxicity potential number below)

☒ NO (If no, go to Factor 5)

Determine the *human health* toxicity potential from Appendix A. Use the same SIC code and subcategory reference as in Factor 1. (Be sure to use the human health toxicity group column ☐ check one below)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
☐ No process waste streams	0	0	☐ 3.	3	0	☐ 7.	7	15
☐ 1.	1	0	☐4.	4	0	☐ 8.	8	20
☐2.	2	0	☐5.	5	5	☐9.	9	25
			☐6.	6	10	☐ 10.	10	30

Code Number Checked: NA

Total Points Factor 4: NA

FACTOR 5: Water Quality Factors

A. Is (or will) one or more of the effluent discharge limits based on water quality factors of the receiving stream (rather than technology-based federal effluent guidelines, or technology-based state effluent guidelines), or has a wasteload allocation been assigned to the discharge:

		Code	Points
☐	Yes	1	10
☒	No	2	0

B. Is the receiving water in compliance with applicable water quality standards for pollutants that are water quality limited in the permit?
NA- discharge is to a dry ditch

		Code	Points
☐	Yes	1	0
☐	No	2	5

C. Does the effluent discharged from this facility exhibit the reasonable potential to violate water quality standards due to whole effluent toxicity?

		Code	Points
☐	Yes	1	10
☒	No	2	0

Code Number Checked: A: 2 B: NA C: 2

Points Factor 5: A: 0 + B: NA + C: 0 = 0 **Total**

FACTOR 6: Proximity to Near Coastal Waters

A. Base Score: Enter flow code here (from Factor 2): 31 *Enter the multiplication factor that corresponds to the flow code:* 0

Check appropriate facility HPRI Code (from PCS):

	HPRI#	*Code*	*HPRI Score*
☐	1	1	20
☐	2	2	0
☐	3	3	30
☒	4	4	0
☐	5	5	20

HPRI code checked: 4

Flow Code	*Multiplication Factor*
11, 31, or 41	0.00
12, 32, or 42	0.05
13, 33, or 43	0.10
14 or 34	0.15
21 or 51	0.10
22 or 52	0.30
23 or 53	0.60
24	1.00

Base Score: (HPRI Score) 0 X (Multiplication Factor) 0 = 0 (TOTAL POINTS A)

B. Additional Points ☐ *NEP Program*
For a facility that has an HPRI code of 3, does the facility discharge to one of the estuaries enrolled in the National Estuary Protection (NEP) program (see instructions) or the Chesapeake Bay?
Not applicable

	Code	Points
☐ Yes	1	10
☐ No	2	0

C. Additional Points ☐ *Great Lakes Area of Concern*
For a facility that has an HPRI code of 5, does the facility discharge any of the pollutants of concern into one of the Great Lakes' 31 areas of concern (see Instructions)
Not applicable

	Code	Points
☐ Yes	1	10
☒ No	2	0

Code Number Checked: A: 4 B: - C: -

Points Factor 6: A: 0 + B: 0 + C: 0 = 0 **Total**

SCORE SUMMARY

Factor	Description	Total Points
1	Toxic Pollutant Potential	0
2	Flows/Streamflow Volume	0
3	Conventional Pollutants	0
4	Public Health Impacts	0
5	Water Quality Factors	0
6	Proximity to Near Coastal Waters	0
	TOTAL (Factors 1 through 6)	0

S1. Is the total score equal to or greater than 80? ☐ Yes (Facility is a major) ☒ No

S2. If the answer to the above questions is no, would you like this facility to be discretionary major?

☒ No

☐ Yes (Add 500 points to the above score and provide reason below)

Reason:

NEW SCORE: 0

OLD SCORE: 55

Permit Reviewer's Name: Janine Howard

Permit Reviewer's Number: 804-527-5046

Date: March 1, 2012